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APPLICATION NUMBER: 60/417,720

FILING DATE: October 10, 2002

RELATED PCT APPLICATION NUMBER: PCT/US03/32382



By Authority of the
COMMISSIONER OF PATENTS AND TRADEMARKS

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N. WOODSON
Certifying Officer

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10/10/02
11064 U.S. PTO

10-11-02 607720.10100A

PROVISIONAL APPLICATION COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION under 37 C.F.R. 1.53 (b)(2).

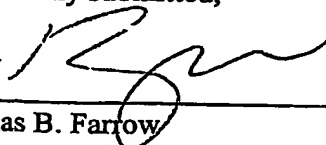
U.S. PTO
60/417720

Docket Number		1305US		Type a plus sign (+) inside this box →	X
INVENTOR(S)/APPLICANT(S)					
Last Name	First Name	MI	Residence (City and either State or Foreign Country)		
King	Mark	A.	Blaine, Minnesota		
Thury	Eugene	G.	St. Paul, Minnesota		
Parkhurst	Gregory	W.	Brooklyn Park, Minnesota		
Marshik	Michael	J.	Circle Pines, Minnesota		
TITLE OF THE INVENTION					
Use of Pressure Sensitive Membrane and Solenoid Actuated Valve for Electronic Dispense Control					
CORRESPONDENCE ADDRESS					
Graco Minnesota Inc. P. O. Box 1441 Minneapolis					
STATE	Minnesota	ZIPCODE	55440-1441	COUNTRY	U.S.A.
ENCLOSED APPLICATION PARTS (check all that apply)					
<input checked="" type="checkbox"/>	Specification	Number of Pages	6	<input type="checkbox"/>	Small Entity Statement
<input checked="" type="checkbox"/>	Drawing(s)	Number of Sheets	1	<input type="checkbox"/>	Other (specify)
METHOD OF PAYMENT (check one)					
<input type="checkbox"/>	A check or money order is enclosed to cover the Provisional filing fees			Provisional Filing Fee Amount (\$)	\$160.00
<input checked="" type="checkbox"/>	The Commissioner is hereby authorized to charge filing fees and credit Deposit Account Number: 07-1775				

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

- ☒ No.
☐ Yes, the name of the U. S. Government agency and the Government contract number are:

Respectfully submitted,

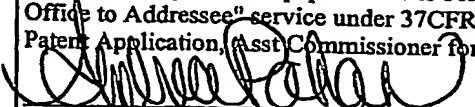

Douglas B. Farrow

Date: October 10, 2002
Reg. No.: 28582

- ☐ Additional inventors are being named on separately numbered sheets attached hereto.

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Andrea Pahan

October 10, 2002
Date

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Patent fees are subject to annual revision.

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See 37 C.F.R. §§ 1.27 and 1.28*Complete if Known*

Application Number	
Filing Date	
First Named Inventor	King
Group Art Unit	
Examiner Name	
Attorney Docket Number	1305US

TOTAL AMOUNT OF PAYMENT \$ 160.00**METHOD OF PAYMENT (check one)**

- 1.
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- The Commissioner is hereby authorized to charge indicated fees and credit any over payments to

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FEE CALCULATION (fees effective 10/01/01)**1. BASIC FILING FEE**

Large Entity Code	Large Entity Fee (\$)	Small Entity Code	Small Entity Fee (\$)	FEE DESCRIPTION	FEE PAID
101	740	201	370	Utility filing fee	
106	330	206	165	Design filing fee	
107	510	207	255	Plant filing fee	
108	740	208	370	Reissue filing fee	
114	160	214	80	Provisional filing fee	\$160.00
SUBTOTAL (1)					\$160.00

2. EXTRA CLAIM FEES

	Extra	Fee from below	Fee Paid
Total Claims	-20** =	X	=
Independent Claims	-3** =	X	=
Multiple Dependent Claims		X	=

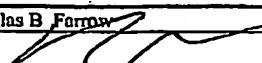
**or number previously paid, if greater, For Reissues, see below

Large Entity Fee Code	Large Entity Fee (\$)	Small Entity Fee Code	Small Entity Fee (\$)	Fee Description
103	18	203	09	Claims in excess of 20
102	84	202	42	Independent claims in excess of 3
104	280	204	140	Multiple dependent claims, if not paid
109	84	209	42	**Reissue independent claims over original patent
110	18	210	09	**Reissue claims in excess of 20 and over original patent
SUBTOTAL (2)				\$0 00

FEE CALCULATION (continued)**3. ADDITIONAL FEES**

Large Entity Code	Large Entity Fee (\$)	Small Entity Code	Small Entity Fee (\$)	Fee Description	Fee Paid
105	130	205	65	Surcharge - late filing fee or oath	
127	50	227	25	Surcharge - late provisional filing fee or cover sheet	
139	130	139	130	Non-English specification	
147	2520	147	2520	For filing a request for reexamination	
112	920*	112	920*	Requesting publication of SIR prior to Examiner action	
113	1840*	113	1840*	Requesting publication of SIR after Examiner action	
115	110	215	55	Extension for reply within first month	
116	400	216	200	Extension for reply within second month	
117	920	217	460	Extension for reply within third month	
118	1440	218	720	Extension for reply within fourth month	
119	320	219	160	Notice of Appeal	
120	320	220	160	Filing a brief in support of an appeal	
121	280	221	140	Request for oral hearing	
138	1510	138	1510	Pet. to institute a public use proceeding	
140	110	240	55	Petition to revive - unavoidable	
141	1280	241	640	Petition to revive - unintentional	
142	1280	242	640	Utility issue fee (or reissue)	
143	460	243	230	Design issue fee	
144	620	244	310	Plant issue fee	
122	130	122	130	Petitions to the Commissioner	
123	50	123	50	Petitions related to provisional applications	
126	180	126	180	Submission of Information Disclosure Statement	
581	40	581	40	Recording each patent assignment per property (times number of properties)	
146	740	246	370	Filing a submission after final rejection (37 CFR 1.129(a))	
149	740	249	370	For each additional invention to be examined (37 CFR 1.129(b))	
Other fee (specify)					
Other fee (specify)					
*Reduced by Basic Filing Fee Paid					
SUBTOTAL (3)					\$0.00

SUBMITTED BY

Name	Douglas B. Farrow	Registration No.	28582	Telephone:	612-623-6769
Signature				Date	October 10, 2002

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Title of Invention: Use of Pressure Sensitive Membrane
and Solenoid Actuated Valve for
Electronic Dispense Control

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USE OF PRESSURE SENSITIVE MEMBRANE AND SOLENOID ACTUATED
VALVE FOR ELECTRONIC DISPENSE CONTROL

RELATED APPLICATIONS

5 This application claims the benefit of US Application serial number _____, filed _

BACKGROUND OF THE INVENTION

10 Meters for dispensing lubricants (oil, transmission fluid) and other related fluids
(washer fluid) are well known. Such meters are manufactured by the assignee of the
instant invention and a number of others and may simply measure the amount manually
dispensed or may operate on a preset basis, that is, the operator enters the desired amount
to be dispensed (e.g. five liters), opens the valve and the meter then dispenses the desired
amount whereupon it shuts off.

15

SUMMARY OF THE INVENTION

It is an object of this invention to provide a software driven method of controlling
the dispense flow rate of lubricants.

The instant invention replaces mechanical actuation of the valve in lubricant dispense meters to provide a software driven method of controlling the dispense of fluids. The design utilizes either a pressure sensitive membrane switch or a multi-position membrane switch in conjunction with either a multistage solenoid actuated valve, a proportional solenoid actuated valve or an on/off solenoid actuated valve to provide operator or programmed control of lubricant dispense frequency and flow rate via the meter's microprocessor.

Use of this technology in the lubrication industry allows for reliable software control of dispense which in turn permits limiting or preventing unauthorized dispense in vehicle service lubricant dispense applications. It also provides total software control of fluid dispense in automatic lubrication applications which today utilize dated timer-controlled, pressure actuated grease injector technology. This technology can be utilized in both on-board and industrial in-plant applications.

These and other objects and advantages of the invention will appear more fully from the following description made in conjunction with the accompanying drawings wherein like reference characters refer to the same or similar parts throughout the several views.

A BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows an exploded view of the meter of the instant invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The instant invention, generally designated 10, is shown in Figure 1. A molded plastic housing is comprised of left and right portions 12a and 12b respectively. A trigger 14 moves about a pivot 14a. Trigger plunger assembly 16 is comprised of first plunger 16a, first plunger spring 16b, second plunger 16c and second plunger spring 16d. Trigger plunger assembly 16 is arranged to contact a pressure sensitive membrane switch 18 which has generally concentric first and second contact rings 18a and 18b. In the preferred embodiment, such a switch can be obtained from Golden Valley Products of Minneapolis, Minnesota and is a multi-position membrane switch. Switch 18 may also be a pressure sensitive membrane switch.

A source of pressurized lubricant or similar fluid (the term lubricant will be used hereinafter to encompass such similar fluids) is connected to inlet fitting 20 which is in turn connected to solenoid valve 22. Solenoid valve 22 is of the type manufactured by Valcor Scientific of Springfield, NJ and in the preferred embodiment is a multistage solenoid actuated valve having three positions - off, low and high. Solenoid valve 22 may also be a proportional solenoid actuated valve or an on/off solenoid actuated valve.

A gear meter 24 is connected to the output of solenoid valve 22 and meters the flow through the assembly by virtue of a hall effect transducer 24a which counts the passage of the gear teeth and the flow associated therewith. A dispense nozzle 26 may be attached to the outlet of meter 24. A display and control assembly 28 having microprocessor control and wireless transmission circuitry is provided for operator interaction.

By separating the trigger 14 for the operator to manipulate from the solenoid valve 22, this meter assembly is uniquely suited for use in a centralized controlled lubrication dispensing system such as one might find at an auto dealer service facility. If the meter 10 is used with such a central system and electronically registered with it, the solenoid valve 5 22 will not be energized to activate until central authorization has taken place. The multi-position pressure sensitive membrane switch 18 and multi-position solenoid valve 22 allow the operator to perform most of a dispense operation at high/full flow while finishing/topping off at a slow rate. If desired, this fast finished with slow sequence may be programmed into the meter software. Alternatively, if it is desired to use the meter 10 without a central system or the central system is down, the meter 10 is fully capable of functioning as a stand-alone preset meter. When used with a pressure sensitive membrane switch and a proportional solenoid actuated valve, the meter may be a fully featherable dispensing device.

It is contemplated that various changes and modifications may be made to the 15 meter without departing from the spirit and scope of the invention as defined by the following claims.

WHAT IS CLAIMED IS:

1. A fluid dispensing meter comprising:

a solenoid valve having at least first and second flow positions;

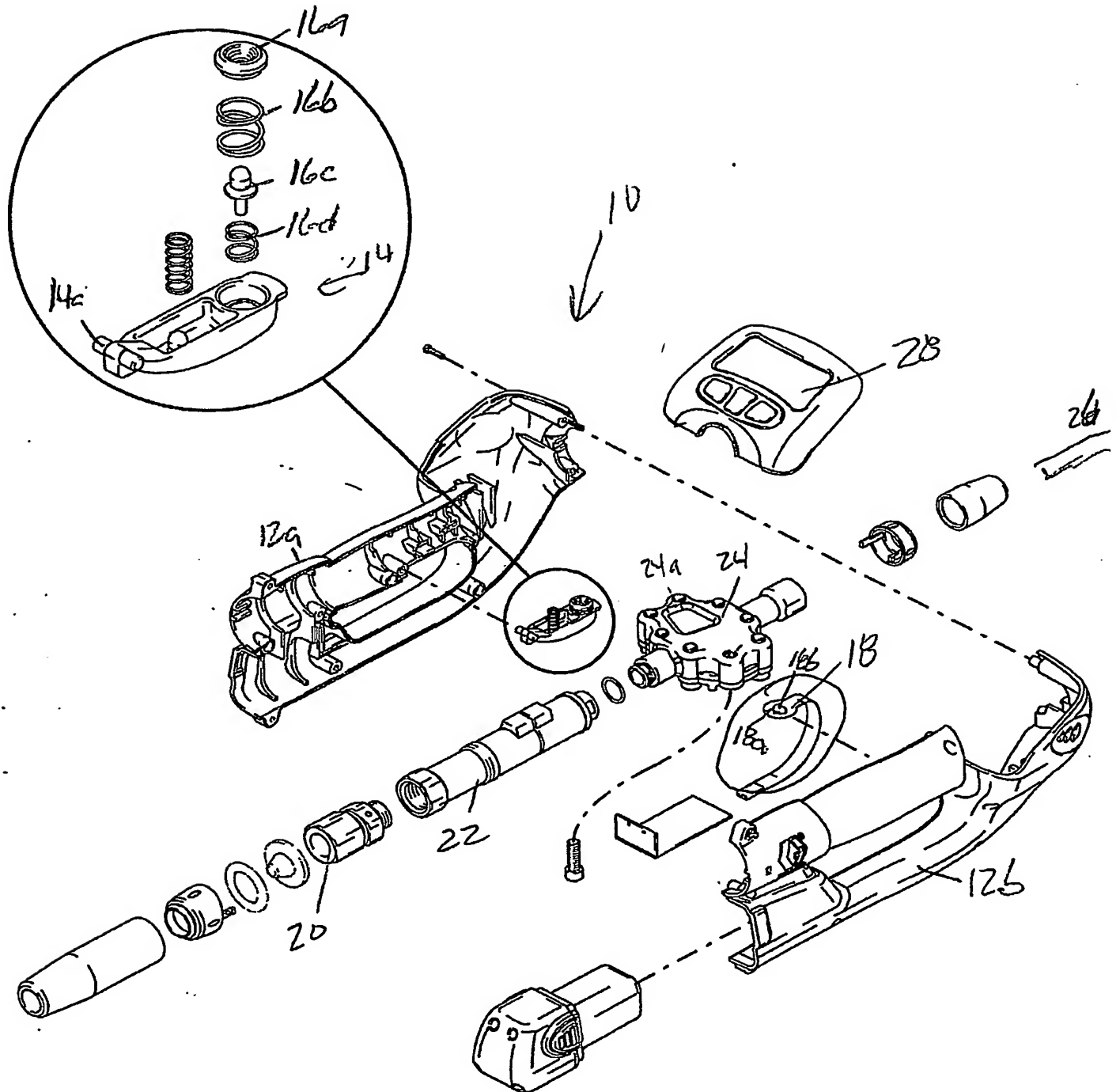
a meter for measuring the amount of fluid dispensed by said meter;

5 an operator-controlled switch having at least first and second flow controlling
positions; and

controls for receiving the position of said switch and operating said solenoid valve
accordingly.
2. The fluid dispensing meter of claim 1 further comprising means for receiving
10 dispense authorization from a source external to said meter and allowing the dispense to
take place.

ABSTRACT

The invention replaces mechanical actuation of the valve in lubricant dispense meters to provide a software driven method of controlling the dispense of fluids. The design utilizes either a pressure sensitive membrane switch or a multi-position membrane switch in conjunction with either a multistage solenoid actuated valve, a proportional solenoid actuated valve or an on/off solenoid actuated valve to provide operator or programmed control of lubricant dispense frequency and flow rate via the meter's microprocessor.



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